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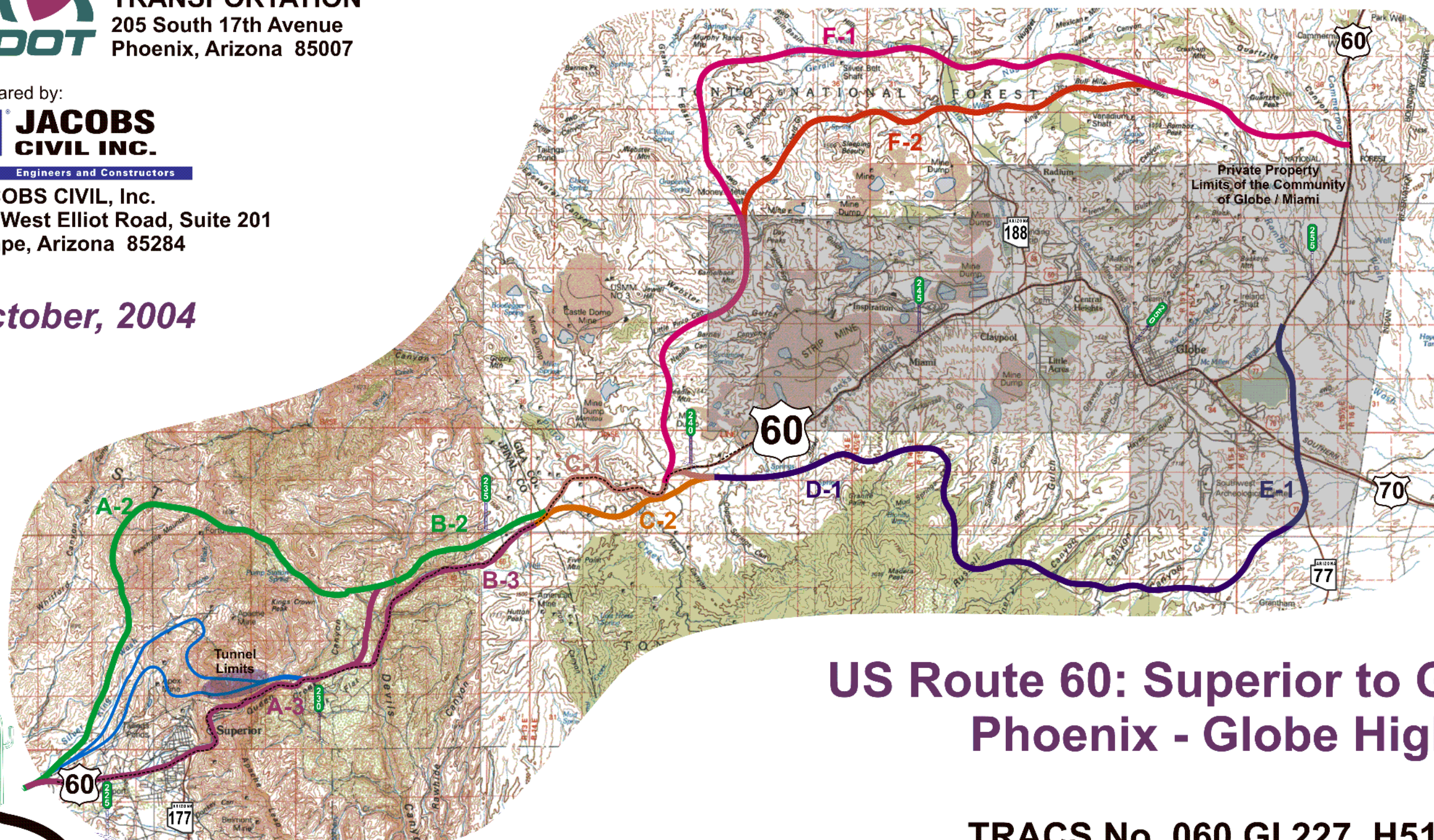


Engineers and Constructors

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October, 2004

# Final Feasibility Report



## US Route 60: Superior to Globe Phoenix - Globe Highway

TRACS No. 060 GI 227 H5160 01L  
Globe District - Pinal & Gila Countys



ARIZONA DEPARTMENT OF TRANSPORTATION

OFFICE MEMO

INTERMODAL TRANSPORTATION DIVISION

December 10, 2004

 TO: RICK POWERS, GLOBE DISTRICT, G300

VICTORIA BEVER, PROJECT MANAGER, 614E

MARY VIPARINA, ASSISTANT STATE ENGINEER, 611E

FROM: VINCE LI, ROADWAY PREDESIGN, 050P

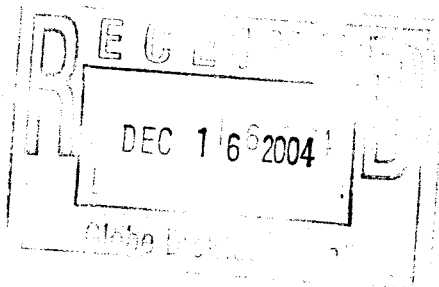
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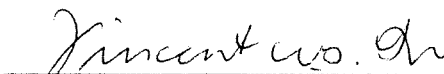
PHOENIX-GLOBE HIGHWAY

US 60



This memorandum is prepared pursuant to Section 3.3 of the ADOT Action Plan for Federal-Aid Highway projects. The proposed major design features for this project are described in the attached Final Feasibility Report.

Your concurrence/approval on the proposed major design features is requested.



VINCENT LI, ROADWAY PREDESIGN MANAGER, 050P

Concurrence:

  
RICK POWERS, GLOBE DISTRICT, G300

1/5/2005  
Date

Concurrence:

  
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1/5/05  
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Approved:

  
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1/7/05  
Date

# EXECUTIVE SUMMARY

## Introduction

This Feasibility Study is submitted in accordance with Contract 99-22 between the Arizona Department of Transportation (ADOT) and Jacobs Civil, Inc. The report presents the results of an investigation of alternatives for improving US 60 between the Town of Superior and the intersection of US 60/US 70 located in the City of Globe (see **Figure A**).

The purpose of the Feasibility Study is to develop and evaluate alternatives for realignment and/or improvement of US 60 between Superior and Globe in order to enhance safety and traffic operational characteristics of the roadway and to meet future traffic demands. This Feasibility Study presents various alternatives for meeting these objectives and compares the differences between the proposed improvements of each alternative and recommends those to be eliminated and those to be retained for further study.

The study area begins at US 60 milepost (MP) 223.8, near the western limits of the Boyce Thompson Arboretum, and extends eastward approximately 30 miles to US 60 MP 258.0, northeast of the intersection of US 70 and US 60 in Globe. The study route is located within Pinal and Gila Counties and lies within the ADOT Globe District.

The project limits had initially started at the eastern end of the Town of Superior, near MP 226.8. However when the alternatives were developed, it became necessary to extend the limits of the study westerly to begin west of the Arboretum, within the limits of the Florence Junction-Superior study limits. ADOT is currently finalizing a Design Concept Report (DCR) for US 60; Florence Junction to Superior that will define needed improvements for that section of highway. While this feasibility study overlaps the easterly end of the Florence Junction to Superior DCR, the improvements proposed within the DCR for Superior will likely be needed and constructed long before the ultimate improvements for this study are constructed.

Several governmental agencies have been involved in the study including the Federal Highway Administration (FHWA), Pinal County, Gila County, Tonto National Forest (TNF), the Town of Superior, the Town of Miami, the City of Globe, Arizona Department of Public Safety (DPS), several departments within ADOT, Arizona State Lands,

Arizona Game and Fish, U. S. Fish and Wildlife Service, U. S. Bureau of Reclamation, U. S. Bureau of Indian Affairs, U. S. Natural Resources Conservation Service, Central Arizona Association of Governments (CAAG), and U. S. Bureau of Land Management (BLM). Private organizations include the Greater Globe-Miami Chamber of Commerce, BHP Copper, Arizona Eastern Railroad, Cyprus Miami Mining Corp. and various utilities.

The alternatives presented are based on rough topography information provided by the United States Geological Survey Service. Following acceptance of the roadway corridor alternatives presented in this study, a Design Concept Report should be conducted to determine a recommended roadway solution, prioritization of the improvement projects, and an implementation schedule.

Supportive to this study, the following technical documents were prepared:

- AASHTO Design Criteria Report
- Traffic and Accident Analysis Report
- Initial Drainage Report (Excluding areas from Segment F)

US 60 serves as a major regional transportation route connecting the Phoenix metropolitan area to recreational areas to the east and north that are located within the White Mountain Apache Reservation and Apache-Sitgreaves National Forest. In addition, the junction of SR 188 and US 60 located between Miami and Globe provides access to Roosevelt Lake and the Tonto National Forest. The roadway also serves as a commercial link between the Phoenix metropolitan area and several towns and communities including Superior and the Globe-Miami area. Mining activities are prevalent along this section of US 60 including mines near Oak Flat, Pinto Valley and in Miami. Near the east end of Globe, US 60 intersects US 70, which connects Safford and other communities in the Gila Valley to the Phoenix metro area. US 60 continues northerly and easterly, serving Show Low, Pinetop-Lakeside and other communities.

The State is experiencing continued population growth. Traffic volumes along the entire route are expected to more than double by design year 2025 with the greatest increase expected between the junction of SR 188 and Globe. Travel speeds are also increasing on State highways. The increase in speed and traffic has increased the

number of accidents and reduced the operation of much of this section of US 60 to a level of service E at the peak hour. This has resulted in requests from the ADOT Globe District personnel as well as the public for improvements to the highway. Section 2 of this report summarizes the Traffic Analysis Report prepared as a separate document. It has become apparent that a proactive, long-range plan is necessary to guide future decisions regarding the improvements being requested for the highway. With this in mind, ADOT is conducting this Feasibility Study as a first step in defining the needed improvements.

## Corridors Investigated

The feasibility study area has been divided into six Segments for purposes of identifying and evaluating alternative alignments. The following alternatives are recommended for further evaluation within a Design Concept Study to ultimately select a recommended alternative:

- Segment A (Approx. 0.7 Miles West of West City Limits of Superior to Devils Canyon):**
- **Alternative A-2:** Construction of a new 4-lane divided highway that extends approximately five miles north of the existing highway, bypassing Superior, from just east of Boyce Thompson Arboretum to Devils Canyon, including new bridges over Devils Canyon.
  - **Alternative A-3b:** Alternative A-3b will provide 2-lanes of traffic in each direction following the existing alignment. Construction will include both a 4-lane roadway with a 16-foot median on existing alignment and a 4-lane divided roadway with one direction using the existing alignment in various locations through the Segment to minimize both cost of construction and impact on Queen Creek. A new 2-lane bridge will be required over Queen Creek, a new 2-lane Queen Creek Tunnel will be required south of the existing tunnel, and a new 2-lane bridge will be required over Devils Canyon north of the existing bridge.



**Alternative A-2** developed to bypass the environmentally sensitive canyon and tunnel requirements of Queen Creek Canyon. While longer, allows for divided highway while avoiding scenic canyon.

**Alternative A-3** corridor considers two alternatives through the existing Queen Creek Canyon and tunnel area: A narrow 4-lane undivided section, as well as building new 2-lane improvements through the canyon on structure. The structure can be a cantilever structure over the ravine, or building the new lanes over the existing.

**Alternative B-2** takes the high road, north of the existing, and follows the high-voltage power lines on a plateau above the canyon where the current roadway is located.

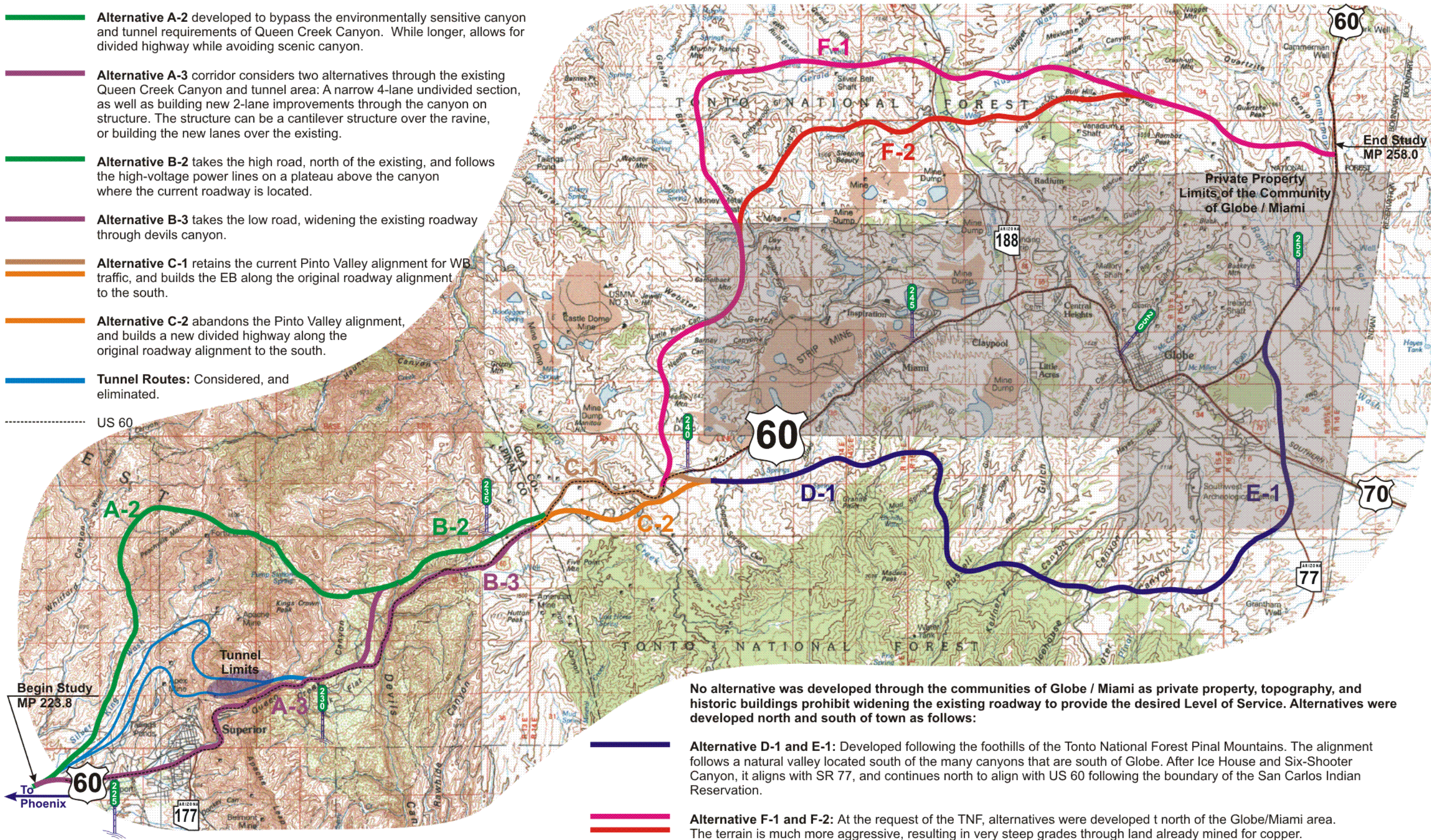
**Alternative B-3** takes the low road, widening the existing roadway through devils canyon.

**Alternative C-1** retains the current Pinto Valley alignment for WB traffic, and builds the EB along the original roadway alignment to the south.

**Alternative C-2** abandons the Pinto Valley alignment, and builds a new divided highway along the original roadway alignment to the south.

**Tunnel Routes:** Considered, and eliminated.

----- US 60





**Segment B (Devils Canyon to Pinal/Gila County Line):**

- **Alternative B-2:** Construction of a new 4-lane divided highway from the new Devils Canyon bridges to just east of the Pinal/Gila County line. The new alignment will be north of the Top of the World area. Alternative B-2 will match Alternative A-2 from Segment A.
- **Alternative B-3:** Alternative B-3 will provide 2-lanes of traffic in each direction. Construction will include both a 4-lane divided roadway with the eastbound traffic following existing US 60 and the westbound lanes on new alignment to the north, and a 5-lane roadway following existing alignment through the Top of the World area. Alternative B-3 will match Alternative A-3 from Segment A.

**Segment C (Pinal/Gila County Line to MP 240)**

- **Alternative C-1:** Construction of a new eastbound 2-lane roadway on new alignment south of existing US 60 from the Pinal/Gila County line to the end of the Segment at approximately MP 240. The westbound lanes will follow the existing US 60 alignment to the vicinity of Pinto Valley Road where it leaves the existing alignment and heads southeasterly to the end of the Segment. A new 2-lane bridge over Pinto Creek is included.
- **Alternative C-2:** Construction of a new 4-lane divided roadway south of existing US 60 from the Pinal/Gila County line to the end of Segment C at approximately MP 240. Two new 2-lane bridges over Pinto Creek are included.

**Segment D (MP 240 to “The Gap”)**

- **Alternative D-1:** Construction of a new 4-lane divided roadway easterly from Segment C to “The Gap” (the term provided by local residents for an area bounded by several canyons located approximately 2 miles west of SR 77, and 4 miles south of existing US 60). This alignment is fully located on the forest, south of Miami, and south of the canyons where development has occurred over the years in Globe. Existing US 60 through Globe and Miami would remain as a business route and a connection to SR 188.

**Segment E (“The Gap” to Jct. US 60 Near MP 254)**

- **Alternative E-1-North:** Construction of a new 4-lane divided roadway from the Junction of US 70 and Alternative E-1 northerly to existing US 60 northeast of Globe. The new roadway will be separated from and cross over the Arizona Eastern Railroad. Directional ramps will connect existing westbound to new westbound US 60 and existing eastbound to new eastbound US 60.
- **Alternative E-2-South:** Construction of a new 4-lane divided roadway from the end of Segment D, turning northeasterly and continuing until it joins existing SR 77. It then follows SR 77 alignment with the northbound roadway using existing SR 77 and a new 2-lane roadway will be constructed to carry southbound traffic. An at-grade intersection connects SR 77 to the new roadway and a half-diamond interchange connects US 70 to the new roadway. Alternative E-2 South will connect with either E-1-North or E-2-North
- **Alternative E-2-North:** Construction of a new 4-lane divided roadway from the Junction of US 70 and Alternative E-2 northerly to existing US 60 northeast of Globe. E-2-North is approximately 0.5 miles east of Alternative E-2-North. The new roadway will be separated from and cross over the Arizona Eastern Railroad. Directional ramps will connect existing westbound to new eastbound US 60.

**Segment F (US 60 MP 240 to MP 257, the Northern Loop)**

Three alternatives were considered for construction of a new 4-lane divided roadway north of the developed towns of Miami and Globe. They begin with common alignments heading north of US 60 from Castle Dome Road, following the northern town limits of Miami/Globe over SR 188, and ultimately connecting to US 60 at MP 254. The three alternatives vary as follows:

- **Alternative F-1:** This is the baseline alternative of the three concepts. The divided highway alignment traverses very abrupt topography skirting the northern town limits, climbing up the Granite Basin and Ruin Basin to cross through the canyons of Gerald Hills, a very steep and narrow canyon. Once through the canyon, the alignment connects with SR 188, crosses Pinal Creek, and follows Henrietta and Ramboz drainageways to ultimately tie into existing US 60 near MP 257.3.

- **Alternatives F-2 and F-3:** Alternatives similar to Alt. F-1, however these two alternatives avoid crossing through Ruin Basin and the Gerald Hills. These alignments develop corridors on the north and south faces of Sleeping Beauty hills, which ultimately required excessive vertical grades and abrupt curves.

**Level of Effort Completed**

Initially, the study investigated improvements from Superior (beginning at the SR 177 intersection) to Globe (ending at the intersection of US 60/US 70). The alignments considered and initial reports were developed with these limits in mind. As the study progressed, the limits of consideration expanded. While the study area was increased over time, the ancillary and supporting reports (traffic, AASHTO, and drainage) were not revised to reflect this expanded effort. It was agreed by ADOT management that the primary purpose of this document was to identify potential corridors for future investigation, and not to make detailed alignment recommendations. Therefore, the necessary revisions to supporting investigations could be made during the development of the Design Concept Reports.

In a similar manor, as the initial Feasibility Report was distributed for review and comment, questions arose challenging the study’s original decision to avoid evaluating corridors north of the Globe/Miami area. This area was avoided in large part because of the difficult terrain, and the recommendations of both the public and agency participants in the study scoping meetings that a reasonable route would likely not be found. One agency partner, the Tonto National Forest, objected to only considering improvements to the south and not comparing routes through the mines and/or private property to the north. As a result, a corridor has been defined (the F Segment Alternatives) for consideration during the DCR development. This area has changed topographically in recent years due to heaving mining activities. As such mapping was not available to develop the corridors to the same level as alternatives to the south. Rather than investigate the northern alternatives in detail, it was agreed that for the purposes of feasible corridor development, that additional study will be focused on northern alternatives as part of the DCR. As such, significant efforts to develop mapped alignments and cost estimates were not developed as part of this study.

Recommendations

All can agree that improvements to US 60 between Superior and Globe are needed. And while the corridors are limited, there are several possible alternatives that must be better investigated to clearly identify the long-term solution to improving US 60:

Corridor Alternatives to Carry Forward

Study Corridor	Alternatives to Carry Forward into DCR
No Build	Consideration of No Build Scenario
A	A-2, A-3
B	B-2, B-3
C	C-1, C-2
D	D-1
E	E-1-North, E-2
F	F-1

A Design Concept Study should be conducted to determine a recommended roadway solution from the above listed alternatives. As these alternatives cannot be constructed quickly, or certainly within a few projects, an series of interim improvements should be developed in concert with the recommended ultimate facilities. This phasing of construction improvements within the corridor can be described within a detailed implementation plan.

Even if the corridor is improved over several years time, it does not seem likely that ADOT will be able to generate the nearly one half billion dollars necessary to complete all of the improvements in the foreseeable future. Therefore, it may not reasonable to complete a detailed study of the improvements through this entire corridor at one time. Just as construction is evaluated in an implementation plan, we recommend that the final study be broken into manageable parts as well.

To focus the attention of the study team on a smaller, more manageable area, we recommend that the final study be broken into two parts; one on either side of the county line separating Pinal and Gila Counties on US 60. While Top of the World may not be a logical termini for most studies, it is a common point between these two major efforts and allow the study team to focus on a smaller area. Furthermore, we recommend that the improvements on the east end be developed first, around the Globe/Miami area. This is the area of greatest congestion and operational challenge.

Both the east and the west study areas have major northerly and southerly alternatives. As a first activity for each study, the initial effort should be focused first on validating if an acceptable solution can be developed in either corridor exclusive of the other. For example, through the Globe/Miami area, if a northern solution can be found, the southern D and E alternatives would likely be eliminated. With a northern solution, the improvements can again be broken into smaller design and construction segments with SR 188 dividing the corridor. If, however, the additional investigation yields the same conclusions that this team encountered with terrain and mining operations, agreement with the Forest and other agencies would then promote detailed investigation of a smaller, single corridor.

The western half of this study area has a similar north/south alternative to resolve. While both corridors can accommodate the transportation needs, one requires significant lands from the forest while the other may be limited by both above and below ground mining operations. In either case, it would behoove the study team to resolve which corridor benefits the area first before developing the final, detailed alignments.

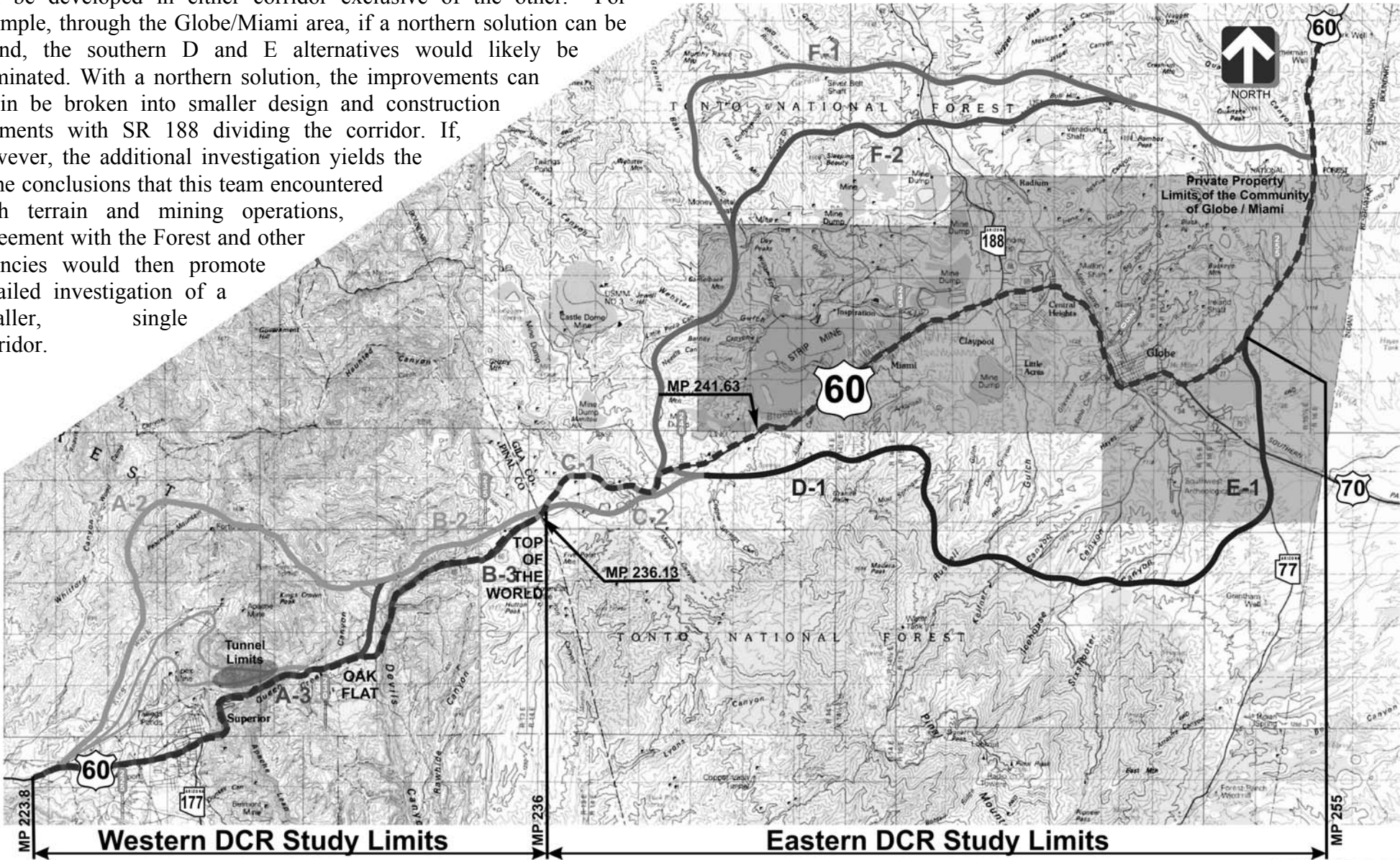


FIGURE B  
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